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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/662,849	09/15/2000	Martin Schuessler	1748X/49153	2146

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CROWELL & MORING, L.L.P.
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Washington, DC 20044-4300

EXAMINER

BHAT, NINA NMN

ART UNIT	PAPER NUMBER
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1764

MAIL DATE	DELIVERY MODE
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09/10/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/662,849

Applicant(s)

SCHUESSLER, MARTIN

Examiner

N. Bhat

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.138(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6 and 8-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6 and 8-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's arguments have been fully and carefully considered. Applicant's petition to withdrawal Finality has been granted. Upon updating the search the examiner has found some references, which will be applied, as a new ground of rejection. Applicant's requests for withdrawal of Finality of the previous actions has been granted.

2. The drawings are objected to because Figure 2 includes non-English labels, i.e. "produkte", "Luft", "flussing", applicant can either delete these words or use English for these words. A new drawing is required. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having

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ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-4, 6, 8-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Autenrieth et al. US Patent 6,447,736.

Autenrieth et al. teach the invention substantially as claimed. Autenrieth et al. teach a modular system for heating or converting at least one medium, the system includes at least a reactor and a heat exchanger, having layers arranged in a stack, the layers include catalytic material. The modular system includes separator devices, which divide the reactor into a plurality of function areas, specifically Autenrieth et al. teach the system includes an evaporator and reforming sections. From Figure 2, Autenrieth et al. teach which includes a system that includes modules (9, 12, 16, 19), which do not adjoin one another directly but with the insertion of one thermally insulating plate (24,25,26). The system includes an evaporator/burner module 9, which is thermally uncoupled from the oxidation stage/pre-reforming module(12). The oxidation stage/pre-reforming module (12) is thermally uncoupled from the shift stage/pre-reforming module(16), and the shift stage/pre-reforming module (16) is thermally uncoupled from the reforming/burner module (19). [Note Column 4, lines 55-65] Autenrieth et al. teach that each module 9,12,15 and 19 can be constructed of an individually determinable number of plate layers so that by means of simple modifications and optimal adaptation is permitted to the respective application. The system as described provides material which passes through the

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layers or flows over the layers having pressure drops which would be expected to one having ordinary skill in the art. With respect the limitations as described in claim 4, from Figure 2 and from the description as referred to above, Auteinrich et al. teach insulating plates which divide the stacked layers into thermally insulated function area. From Figure 2, the insulating plates extend essentially parallel to the layers. Regarding applicant's limitations regarding the educts which extend through at least a portion of the layers, the connection ducts and product ducts this has been taught and suggested as specifically described in Figure 3, Column 5, lines 59 to Column 6, lines 1-15.

However, with respect to the specific end plate, the end plate construction being aluminum, clamping and tie rod arrangement. These limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because Auteinrich et al. teach providing a system for methanol reforming in a system which includes a modular reaction unit of the plate stack which is integrated to provide an catalytic burner that is in thermal contact with the evaporator which is adjoined by an oxidation stage/reforming module (12) also including a plate stack construction each section, i.e. between the evaporator section and reforming section there is included an insulating plate. With respect to the end plate, although not expressly taught this is implicitly suggested by the modular construction and insulating plate as described by the reactor to specifically use the end plate between modules would have been obvious to one having ordinary skill. With respect to the material, of the end plate being aluminum, and artisan familiar with reactor design and heat exchange would be able to recognize from the teachings of Autienrich et al. to select a particular plate material for constructing the reactor and evaporator/heat exchange modular systems. With respect to the clamping and tie rod and sealing arrangement these limitations would have been an obvious

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design choice to one familiar with providing modular stack type reactors absent criticality in showing.

6. Claims 1-4, 6, and 8-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonjo et al USP 6,159,434 in combination with Schussler et al. DE 19743673 further in view of Koga et al. USP 5,270,127.

Gonjo et al. teach a system for heating or converting at least one medium, which comprises at les one evaporator, a reactor, and heat exchanger having layers arranged in stack. The stack includes a separator device (46), which divides the stack into a plurality of function areas, i.e., the separator device separates the evaporator from the reaction areas. The layers are disposed between the lower end plate and upper end plate.[Note Gonjo et al. Figure 9, Figure 1, and Column 5, lines 15-22 and Column 6, lines10-19]. Gonjo et al. teach the use of alloy player layers some of which having catalyst disposed thereon. Gonjo et al. does not specifically teach that the layers are formed by pressing the catalyst material onto the plate. The specific deficiency of Gonjo et al. of pressing catalyst material onto a plate within a stack plate reactor has been taught by Schussler et al. To specifically press the catalyst material onto a plate reactor where coating has been taught by Gonjo et al. would have been obvious to the ordinary artisan and further, this recitation of the artisan puts catalyst onto a plate, is immaterial when claiming and apparatus, the apparatus of Gonjo et al. is equivalent is function to the that of Schussler.

However, neither Gonjo et al. nor Schussler et al. teach that an insulating plate are provided between the end plates and layers which are respectively adjacent to the end plates.

Koga et al. teach a plate type shift reactor which includes a stack of alternately piled shift reactors plates and cooling plates, the reactor includes various gas intake and exhaust manifolds mounted on the lateral faces of the stack.[Note the Abstract and Figure 2]. Koga et al. teach

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and depict in Figure 6, an air feed line (106) and a discharge line (107) are connected to the air electrode 2 and a cooling agent feed line (108) and a discharge line (109) are connected to the cooling portion (7). The plate type reformer (6) includes a plate type heat exchanger (61) and the plate type shift converter (30) are in the same pile. Because of the different operation temperatures of these units, heat insulators may be interposed between the units. [Note Column 10, line 9-17]

It would have been obvious to one having ordinary skill in the art from the combined teachings of Gonjo et al., Schussler and Koga et al. to provide a modular system which includes a reactor and heat exchanger having layers arranged in a stack, the wherein the stack includes separator devices which divides the system into a plurality of function areas, the layers are arranged between a lower end plate and upper end plate and insulating plates are provided between the end plates and layers which are respectively adjacent to the end plates. This concept has been fully taught and suggested by the stack reactors of Gonjo et al., Schussler and Koga et al. it is maintained that from reading the references, that applicant's invention has been taught and suggested by the prior art and has been rendered obvious, the stack reactor which includes heat exchanger distinct areas and including an insulating plate for the known purpose of improving the overall heat efficiency of the reforming process has been taught in Koga et al. and the invention as a whole is rendered obvious to one having ordinary skill in the art at the time the invention was made.


5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cwik et al. teach a device for feeding educts to parallel spaces. Watkins et al. teach a modular isothermal reactor.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


N. Bhat
Primary Examiner
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